

The Files

18 September 1956

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Trip and Progress Report, [REDACTED]

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1. On 22 and 23 August 1956, I visited the [REDACTED] Plant in [REDACTED] to determine the status of the tasks under the subject contract.

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25X1A5a1 Those persons contacted at [REDACTED] were:

25X1A5a1 [REDACTED]

2. The principal topics of discussion were Task Orders 1 and 2. Task Order 1 concerns the miniature recorder being developed for ELINT Activities Branch and Task Order 2 concerns the "break-down" recorder being developed for Auxiliary Functions Branch. Task Orders 4 and 5 were briefly mentioned, however work on Task Order 4 has not yet started. This concerns additional work on the "wrap-around" recorder. Task Order 5, the high frequency (300-25000 cps) version of the "break-down" recorder, has been started in that much of the basic material developed under Task Order 2 will be applicable to this unit. Parts and pieces are now being delivered by various suppliers for the fabrication of a unit which will eventually form the basis for the prototype of Task Order 5.

3. A complete working engineering model of the "break-down" recorder is available. The unit was operating with a full load of tape, and on voice recording appeared to be quite satisfactory. There was little evidence of wow or flutter in the output. It was interesting to note that the loss of intelligibility of the spoken word during the reversal period of the machine at the end of a track was hardly noticeable. On a musical selection, the reversal of the machine at the end of the track was not noticeable at all and I would not have been aware of the change unless I had heard the machine itself click during this interval. Other tests, however, revealed certain failings of the unit. The quality of recording a steady-state signal, particularly the frequencies below 1000 cycles, is rather poor with considerable distortion evident. [REDACTED] indicated this was due primary to insufficient bias current across the head. The present head is operating at 2.1 mils and should be operating at 3.5 mils. This has necessitated a redesign of the bias oscillator and the work is not yet complete. It will probably be necessary to use a push-pull oscillator in order to get sufficient drive. I noted also, that there appeared to be some distortion resulting from the signal beating with the bias oscillator at frequencies above 4000 cycles. [REDACTED] indicated that they would investigate this and take necessary steps to correct it. The method devised for loading and removing the tape appears to be quite satisfactory with one end of the

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magnetic tape being attached to a special plastic core. Loading is quite simple, with unloading hardly less simple, except that a small screw driver should be used to first free the plastic core from the reel. I suggested the use of a special flat tool for this. [REDACTED] indicated that they would make one and try it out. The recorder has recently undergone a series of cold-chamber tests with the self-contained batteries. The results of this will be tabulated and forwarded to us at a later date, however, the highlight of the test indicated that the recorder will operate satisfactory for a full 24-hour period at a minimum temperature of minus 40° Fahrenheit. Below this temperature the recorder continues to operate satisfactory but the batteries lose voltage and capacity. It became quite evident that the original schedule of 31 August will not be met. I discussed this problem at some length with [REDACTED] who explained that a number of factors effected this, not the least of which was a complete company re-organization early in the summer. The company management has now been stabilized, and all other factors relating to this task have been largely resolved. One problem affecting delivery was the under estimation of the engineering time required for the amplifier. During the initial estimates, 360 hours of engineering time for the design had been assigned. At this date, more than 1200 hours have been spent designing the amplifier. Most of this was spent in trying to eliminate the noise interference created by the motor. At the moment, everything seems satisfactory, and close inspection of the amplifier output on an oscilloscope showed no evidence of motor noise. I have reviewed the delivery schedules of the various parts and pieces which are being manufactured by outside suppliers and find that the latest delivery estimate is 6 October 1956. This is for the outer case of the unit. [REDACTED] assured me that the units themselves would be completed and tested prior to this time and that the only required work prior to shipment to us will be to install the units in the case. I pointed out that a letter from the company to the contracting officer will be required, indicating the new delivery schedule. I also requested at this time that all programs, Task Orders 1 through 5, be very closely reviewed and that if any change in time is necessary, to incorporate these in the same letter. [REDACTED] gave his assurance that this will be given their immediate attention.

4. On Thursday morning, 23 August, accompanied by [REDACTED], I visited the plant of [REDACTED] where we met with [REDACTED] Vice-President. This trip was made for two reasons. I wished to observe the status of the motor which [REDACTED] is making under sub-contract to [REDACTED] for the miniature recorder, and secondly I wished to inspect the facilities of this plant as they appear to have great capabilities in electro-mechanical equipments.

5. The motor design for the miniature recorder has been finalized and production of the motors is well under way. A drawing of this motor is attached. It will be noted that the armature consists of three flat coils attached to a commutator consisting of twelve segments. This will rotate in a ring magnet of 8 poles. The speed of rotation is relatively slow and the armature shaft will be the direct drive capstan for the tape. I was rather intrigued by the ring magnet and asked [REDACTED] if his company had had any difficulty in getting it. He admitted they had, and indicated that

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25X1A5a1 [redacted] and certain other companies had declined to make such a unit.
25X1A5a1 [redacted] then proceeded to make their own. The method of manufacture is rather unique, and to my knowledge has not been duplicated elsewhere. This [redacted]

25X1A5a1 6. Back at the [redacted] I discussed the problem of the
miniature recorder at greater length and find that the solving of the motor
25X1A5a1 problem has apparently removed the last major barrier in the design of this
recorder. [redacted] assured me that earlier experiments have indicated
that there will be no major problems in the production of the amplifier unit
for the system nor for the production of a play-back unit to be used in
connection with these units.

7. We discussed briefly Task Order 5, the high frequency adaptation of
the "break-down" recorder, but there is little information available, as the
unit has not yet been built. The principal effort now being directed toward
production of the items under Task 2.

25X1A5a1 8. In conclusion, the work at [redacted] appears to be technically
satisfactory although the delivery schedules are not being met. There is,
however, considerable evidence that the situation is well in hand and that
we can expect delivery of the items under Task 2 to be made by mid-October.
The delivery of the miniature recorders under Task 1 will probably not be
available before the later part of the year. I should also like to add that
I was considerably impressed by the versatility and capability of the
facilities available at [redacted] They appear to be 25X1A5a1
ideally suited for such work as limited production of the ATP-3 printer and
in all likelihood could make certain desirable improvements in the unit. I
also had in mind the work anticipated on repackaging and redesigning of the
25X1A5a1 ET-2. [redacted] has been
cleared by this Agency, although at the time, he was [redacted]
25X1A5a1 A request has been made of the Security Division of Logistics to have
[redacted] clearance renewed and transferred. 25X1A5a1

Attachment:

Drawing of miniature motor

OC/E/R&D-EP/FCS:jac (18 September 1956)

cc: ✓ Monthly Report (2)

R&D Subject File

Lab

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